

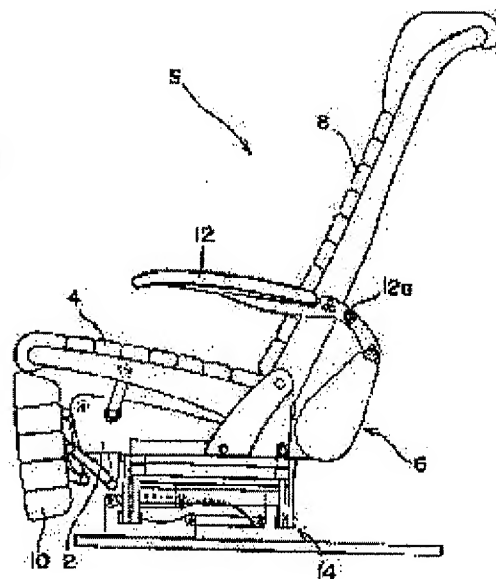
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**SOLUTION:** One end of a reclining adjuster to change an inclination angle of a seat back 8 is pivotally installed on a support body 2 of a reclining seat S, and one end of an arm rest 12 is pivotally installed on the other end of the reclining adjuster. A part of the arm rest 12 apart from one end is pivotally installed on the seat back 8, and the reclining adjuster is oscillated backward, so the seat back 8 is fallen backward, with the arm rest 12 set to be roughly flat with a seat cushion 4 and the seat back 8.



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**CLAIMS**

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[Claim(s)]

[Claim 1]A seat cushion.

A seat back attached enabling free devotion to this seat cushion.

An armrest.

A foot rest.

Are the reclining seat provided with the above and an end of a reclining adjuster which changes the above-mentioned seat back's angle of inclination into a base material of the above-mentioned reclining seat is pivoted, While pivoting one end of the above-mentioned armrest in the other end of this reclining adjuster, A part estranged from the above-mentioned end of the above-mentioned armrest is pivoted in the above-mentioned seat back, The above-mentioned seat back is made to incline backward, and it was made to make the above-mentioned armrest with the above-mentioned seat cushion and the above-mentioned seat back by rocking the above-mentioned reclining adjuster back into abbreviated flush.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]In this invention, a seat back is back concentrated to a seat cushion. Therefore, it is related with a reclining seat usable also as a bed.

[0002]

[Description of the Prior Art]Conventionally, various reclining seats which enabled it to concentrate a seat back to a seat cushion are proposed.

[0003]Generally, while a reclining seat attaches an internal gear to either one of a seat cushion and a seat back, The external gear which meshes with an internal gear is attached to another side, and when a gear pair carries out eccentric rotation with the driving force from a drive motor, it is constituted so that a seat back may concentrate.

[0004]

[Problem(s) to be Solved by the Invention]However, if it is in the above-mentioned conventional reclining seat, The engage part article was attached to the seat cushion and the seat back, by covering the above-mentioned parts with about at least 35-mm cushioning material, foreign body sensation needed to be canceled and there was room of examination in respect of manufacture of an easy sheet.

[0005]For the composition which only a seat back makes incline where the back inclined seat cushion is held, a seat cushion and a seat back could not be made into the full flat, but using it as a bed had unreasonableness.

[0006]What forms an armrest and gave lateral support nature may sense difficulty for getting on and off for the handicapped.

[0007]Are usable also as a bed by making this invention in view of such a problem that conventional technology has, inclining backward and making a seat back into an abbreviated full flat to a seat cushion, It can get on and off easily also to the handicapped, and manufacture and operation are aimed at providing an easy reclining seat.

[0008]

[Means for Solving the Problem]To achieve the above objects, among this inventions the invention according to claim 1, In a reclining seat which has a seat cushion, a seat back attached enabling free devotion to this seat cushion, an armrest, and a foot rest, While pivoting one end of a reclining adjuster which changes the above-mentioned seat back's angle of inclination into a base material of the above-mentioned reclining seat and pivoting one end of the above-mentioned armrest in the other end of this reclining adjuster, A part estranged from the above-mentioned end of the above-mentioned armrest is pivoted in the above-mentioned seat back, making the above-mentioned seat back incline backward by rocking the above-mentioned reclining adjuster back -- and the above-mentioned armrest -- the above-mentioned seat cushion and the above-mentioned seat back -- abbreviated -- it is a reclining seat making it flat-tapped.

[0009]The invention according to claim 2 raises the rear of the above-mentioned seat cushion with rocking behind the above-mentioned reclining adjuster, and it was made to make it into a bed condition of an abbreviated full flat.

[0010]The invention according to claim 3 has composition which can be interlocked with the above-mentioned seat back's backward inclination, and can raise a front end part of the above-mentioned foot rest, and the above-mentioned foot rest was made to be made to an abbreviated full flat with the above-mentioned seat cushion and a higher rank seat back as for it.

[0011]The invention according to claim 4 forms interlocking mode in which the above-mentioned seat back's angle of inclination and an angle of inclination of the above-mentioned foot rest are changed simultaneously, and the independent mode changed independently, and enabled it to change independently an angle of inclination of the above-mentioned foot rest also in the above-mentioned interlocking mode.

[0012]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described, referring to drawings. Drawing 1 and drawing 2 are provided with the following.

The two side frames 2 (only one side is shown by drawing 1 and drawing 2) which show the reclining seat S concerning this invention, and were provided in both sides as a base material of the reclining seat S.

The seat cushion 4 attached to the side frame 2 enabling free rocking.

The seat back 8 attached to the seat cushion 4 via the reclining mechanism 6 enabling free devotion.

The foot rest 10 attached to the front end part of the seat cushion 4 enabling free rocking, and the armrest 12 attached to the seat back 8 enabling free rocking.

14 is an excitation apparatus for giving a moderate vibration of a sliding direction and a longitudinal direction to the reclining seat S.

[0013]As shown in drawing 1 and drawing 2, the reclining seat S concerning this invention can also be used as a bed like drawing 2 by making the seat back 8 incline backward from the usual sitting state of drawing 1, and making the whole sheet into an abbreviated full flat.

[0014]In drawing 3, a sitting state is a solid line, and the bed condition is shown by the dashed line,

and as shown in this figure, as for the seat cushion frame 4a accommodated in the seat cushion 4, that approximately center part is connected with the side frame 2 via the lever 16. In the part A which the rear end part of the side frame 2 is pivoted in the lower end part of the seat back frame 8a, and carried out prescribed distance alienation from this pivot part at the headrest side, The pars intermedia (part which carried out prescribed distance alienation from the back end at the front end side) of the armrest 12 is pivoted by the seat back frame 8a. The rear end part of the armrest 12 is pivoted in the upper bed of the reclining adjuster 18 with which the lower end was pivoted in the rear end part of the side frame 2.

[0015]In the above-mentioned composition, if the reclining adjuster 18 is made to rock back from the sitting state of drawing 1, the upper bed part will move to a back slanting lower part with the rear end part of the armrest 12. Since the armrest 12 and the seat back 8 of each other are pivoted by the part A, while the seat back 8 inclines backward to a horizontal position almost in parallel with the reclining adjuster 18, the armrest 12 also descends almost in parallel synchronizing with the seat back 8. while the back (portion which a seating person's hip contacts) of the seat cushion 4 will be raised and the seat cushion 4 and the seat back 8 will be in an abbreviated full flat state at this time -- the armrest 12 -- the seat cushion 4 and the seat back 8 -- abbreviated -- it becomes flat-tapped.

[0016]Drawing 4 shows the reclining mechanisms 6 and 6 and the ottoman link mechanisms 20 and 20 which were provided in the both sides of the reclining seat S.

[0017]As shown in drawing 4, the reclining adjuster 18 formed in each reclining mechanism 6, It has the drive motor 22, and the internal gear (not shown) and external gear (not shown) which mesh mutually, and when only at least 1 gear tooth has few numbers of teeth and a gear pair carries out eccentric rotation on the torque of the drive motor 22 from an internal gear, the reclining adjuster 18 rocks external gear to a cross direction. The reclining adjuster 18 on either side is mutually connected with the connecting shaft 24, and has composition which the reclining adjuster 18 on either side synchronizes and rocks.

[0018]Since it is publicly known, this reclining adjuster 18 already omits that detailed explanation.

[0019]On the other hand, each ottoman link mechanism 20 is provided with the following.

Drive motor 26.

The slide screw 30 rotated with the drive motor 26 via the transmission 28.

The slide nut 32 which gears with the slide screw 30.

The slide nut 32 has adhered to the bracket 36 fixed to the linear guide 34, and the linear guide 34 is slidably attached to the cross direction along the linear way 38.

[0020]The back end of the 1st link 40 is pivoted by the bracket 36, and the approximately center part of the 1st link 40 is pivoted with the approximately center part of the 2nd link 42 with which the end was pivoted by the side frame 2. Further two or more links 44, --, 44 are pivoted by the 1st link 40 and the 2nd link 42, and the bracket 46 for attaching the foot rest 10 at the tip of two or more links 44, --, 44 is pivoted. The 2nd link 42 and 42 on either side is mutually connected by the stabilizer 48.

[0021]In the reclining seat S of the above-mentioned composition, the reclining mechanism 6 and

the ottoman link mechanism 20 can be interlocked mutually, and it can operate them, and they not only can operate independently, respectively, but explain the operating state below.

[0022]As shown in drawing 5, the reclining seat S is operated by the controller 50. The controller 50 is provided with the reclining anteversion switch 54, the reclining backward-tilting switch 56, the ottoman elevation switch 58, the ottoman lowering switch 60, and the interlock switch 62 which were connected to MPU (processing unit)52 and MPU52. The drive motor 22 which drives the reclining mechanism 6 is connected to MPU52 via the driver 64, and the drive motor 26 which drives the ottoman link mechanism 20 is connected to MPU52 via the driver 66. The position sensing devices 68 and 70 which detect the position of the drive motors 22 and 26 are connected to MPU52.

[0023]Drawing 6 shows the flow chart for choosing independent either the interlocking mode in which the seat back's 8 angle of inclination and the angle of inclination of the foot rest 10 are changed simultaneously or the mode changed independently.

[0024]In Step S1, it is judged first whether the interlock switch 62 is set to ON. When the interlock switch 62 is ON, the interlocking mode operates in Step S2, and when the interlock switch 62 is OFF, the independent mode operates in Step S3.

[0025]Drawing 7 is a flow chart which shows operation in interlocking mode, and it is first judged in Step S11 whether the reclining anteversion switch 54 is set to ON. When the reclining anteversion switch 54 is ON, while the seat back 8 inclines forward with the driving force of the drive motor 22 in Step S12, in Step S13, the front tip part of the foot rest 10 descends with the driving force of the drive motor 26. On the contrary, when the reclining anteversion switch 54 is OFF, in Step S14 and Step S15, the seat back 8 and the foot rest 10 are held at a state as it is.

[0026]Next, when it is judged whether the reclining backward-tilting switch 56 is set to ON in Step S16 and it is set to ON. While the drive motor 22 rotates to an opposite direction with the seat back's 8 anteversion in Step S17 and the seat back 8 does backward tilting, in Step S18, the drive motor 26 also rotates to an opposite direction, and the front tip part of the foot rest 10 goes up. On the contrary, when the reclining backward-tilting switch 56 is OFF, in Step S19 and Step S20, the seat back 8 and the foot rest 10 are held at a state as it is.

[0027]Thus, although the seat back 8 and the foot rest 10 can be interlocked in interlocking mode with the reclining anteversion switch 54 or the reclining backward-tilting switch 56, Only the foot rest 10 can also be operated with the ottoman elevation switch 58 or the ottoman lowering switch 60 to change the angle of inclination of the foot rest 10.

[0028]That is, when it is judged whether the ottoman lowering switch 60 is set to ON in Step S21 and it is set to ON, in Step S22, the front tip part of the foot rest 10 descends. On the contrary, when the ottoman lowering switch 60 is OFF, in Step S23, the foot rest 10 is held at a state of rest. Next, in Step S24, when the ottoman elevation switch 58 is ON, in Step S25, the front tip part of the foot rest 10 goes up, and when the ottoman elevation switch 58 is OFF, in Step S26, the foot rest 10 is held at a state of rest.

[0029]Drawing 8 is a flow chart which shows operation in the independent mode, and it is first judged in Step S31 whether the reclining anteversion switch 54 is set to ON. When the reclining

anteversion switch 54 is set to ON, in Step S32, the seat back 8 inclines forward with the driving force of the drive motor 22. On the other hand, when the reclining anteversion switch 54 is OFF, in Step S33, the seat back 8 is held at a state as it is.

[0030]Next, when it is judged whether the reclining backward-tilting switch 56 is set to ON in Step S34 and it is set to ON, in Step S35, the drive motor 22 rotates to an opposite direction with the seat back's 8 anteversion, and the seat back 8 does backward tilting. On the other hand, when the reclining backward-tilting switch 56 is OFF, in Step S36, the seat back 8 is held at a state as it is.

[0031]Next, when the ottoman elevation switch 58 is ON in Step S37, in Step S38, the front tip part of the foot rest 10 goes up, and when the ottoman elevation switch 58 is OFF, in Step S39, the foot rest 10 is held at a state of rest. When it is judged whether the ottoman lowering switch 60 is set to ON in Step S40 and it is set to ON, in Step S41, the front tip part of the foot rest 10 descends. On the contrary, when the ottoman lowering switch 60 is OFF, in Step S42, the foot rest 10 is held at a state of rest.

[0032]Drawing 9 is a flow chart which shows the operating state of the reclining mechanism 6 at the time of seat-back anteversion, first, in Step S51, clears a reclining backward-tilting flag, and judges whether the reclining anteversion flag is cleared in continuing Step S52. When the reclining anteversion flag is cleared, a timer flag is set in Step S53, and the seat back 8 inclines forward with the driving force of the drive motor 22 in Step S54.

[0033]In Step S53 here a timer flag, When the position sensing device 68 is detecting it as the drive motor 22 operating, it is always set (state of the count 0), and when the drive motor 22 stops, the count by a timer is started by the signal from the position sensing device 68. Namely, although the seat back 8 is coming to the operation end point, when the reclining anteversion switch 54 is still pressed, or -- the foreign matter to the armrest 12 or the seat back 8 or a part of body puts [ the reclining mechanism 6 ] during the seat back's 8 devotion, for example -- etc., when it becomes an overload (it mentions later for details) and stops, The count by a timer is started and it is judged whether in Step S55, it became time over. In time over, it is judged whether the reclining anteversion switch 54 is set to ON in Step S56. In ON, the drive motor 22 stops in Step S57, a reclining anteversion flag is set in Step S58, and a reclining backward-tilting flag is cleared in Step S59. That is, when the seat back 8 reaches an operation end point, or when it becomes an overload, it has the composition that it is resettable by pressing the switch of the opposite direction which did not operate even if the switch was again pressed by the operating direction before a stop, but was operating before the stop.

[0034]Since it is fundamentally the same, the operating state of the ottoman link mechanism 20 at the operating state of the reclining mechanism 6 at the time of seat-back backward tilting and the time of a foot-rest rise or descent also abbreviates the explanation to the flow chart of drawing 9.

[0035]Although not shown in drawing 3, it puts between the reclining seat S concerning this invention as the armrest 12, the seat cushion 4, or the seat back 8, and the safety measures for prevention are given to it. Namely, as shown in drawing 1 and drawing 2, the rotary hinge 12a is formed in a part of armrest 12 (the pivot part of the armrest 12 and the reclining adjuster 18, and pars intermedia with the part A), When a part of foreign matter and body are put between the

armrest 12, the seat cushion 4, or the seat back 8, For example, by sending out the signal from an overload detection means (not shown) to MPU52, as shown by the two-dot chain line of drawing 10, the armrest 12 is raised up.

[0036]

[Effect of the Invention]Since this invention is constituted as explained above, it does so an effect which is indicated below. According to the invention according to claim 1, the end of the reclining adjuster which changes a seat back's angle of inclination into the base material of a reclining seat is pivoted among this inventions, While pivoting one end of an armrest in the other end of a reclining adjuster, Since it enabled it to change a seat back's angle of inclination with the reclining adjuster of a different body with a seat back by pivoting in a seat back the part estranged from this end, the composition of a seat cushion and a seat back becomes simple, and that manufacture is easy. moreover -- making a seat back incline backward by rocking a reclining adjuster back -- and an armrest -- a seat cushion and a seat back -- abbreviated -- since it was made to make it flat-tapped, getting on and off to a reclining seat is easy also for the handicapped.

[0037]According to the invention according to claim 2, since the rear of a seat cushion can be raised with rocking behind a reclining adjuster and it can be made the bed condition of an abbreviated full flat, even if a user lies on a reclining seat, sense of incongruity is not received.

[0038]According to the invention according to claim 3, since the foot rest was made to be made into an abbreviated full flat by being interlocked with a seat back's backward inclination and raising the front end part of a foot rest with the seat cushion and the seat back, operation of a reclining seat is easy.

[0039]According to the invention according to claim 4, since interlocking mode and the independent mode are formed and it enabled it to change the angle of inclination of a foot rest independently also in interlocking mode, the user can take a desired posture easily by easy operation.

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[Translation done.]